

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TERRI A. CLINGERMAN and LEON C. WILLIAMS

Appeal No. 1998-0220
Application No. 08/297,437

ON BRIEF

Before JERRY SMITH, FLEMING, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 2, 8-11, 17, 18, 24, 30, 31, 33, and 34.

We affirm.

BACKGROUND

The invention is directed to two-dimensional digital filters. Claim 1 is reproduced below.

1. An image processing device for filtering digital image data, comprising:

a plurality of discrete one-dimensional first dimension filters operating concurrently on real-time digital image data in a first dimension, each of the filters operating on the digital image data in accordance with predetermined filter coefficients to produce a one-dimensional output signal;

a single second dimension filter, operating in a second, distinct dimension, for receiving output signals from one of the plurality of first dimension filters and operating on the output signals in real-time in accordance with one of a plurality of sets of predetermined filter coefficients to produce a second filtered output signal therefrom; and

means, operating in conjunction with the first and second dimension filters, for controlling the non-predetermined selection of the first dimension filter and the set of filter coefficients to be used as inputs to the second dimension filter.

The examiner relies on the following evidence:

Thompson et al. (Thompson)	4,766,561	Aug. 23, 1988
Kobayashi et al. (Kobayashi)	5,131,059	Jul. 14, 1992

Appellants' Admitted Prior Art (the APA)

Claims 1, 2, 8-11, 17, 18, 24, 30, and 31 stand rejected under 35 U.S.C. § 103 as being unpatentable over the APA and Thompson.

Claims 33 and 34 stand rejected under 35 U.S.C. § 103 as being unpatentable over the APA, Thompson, and Kobayashi.

In the Second Supplemental Examiner's Answer (Paper No. 32) the examiner indicates that, subsequent to entry of amendments after the Final Rejection, earlier rejections of claims 3-7, 12-16, 19-23, 25-29, and 32 have been withdrawn, and those claims now stand allowed.

We refer to the Final Rejection (Paper No. 22) and the Examiner's Answer (Paper No. 27) for a statement of the examiner's position and to the Brief (Paper No. 26) and the Reply Brief (Paper No. 29) for appellants' position with respect to the claims which stand rejected.

OPINION

Appellants submit arguments in the Brief directed to independent claim 1, which we will consider as representative of all the independent claims. See 37 CFR § 1.192(c)(7). Appellants also submit arguments in support of dependent claims 2, 10, and 31, and in support of dependent claim 33, which is subject to a different ground of rejection. We consider the appellants' arguments in turn for each of the above-noted claims.

The examiner offers the APA and Thompson as evidence of the obviousness of the subject matter of claims 1, 2, 8-11, 17, 18, 24, 30, and 31. The APA, as shown in appellants' Figure 2 and described in the specification at the paragraph bridging pages 8 and 9, is the prior art approach for implementation of two-dimensional digital filters, with two independent filter channels 60 and 62. Two slow scan (first dimension) filters 66a and

66b, with respective slow scan filter coefficients, operate on individual pixels within a particular scanline simultaneously. The outputs from slow scan filters 68a and 68b are passed to independent fast scan (second dimension) filters 68a and 68b, respectively. Applying fast scan filter coefficients to filters 68a and 68b results in the filtered output of channels 60 and 62, respectively. The output of one of the channels is selected via multiplexer 72 to provide filtered video output on a pixel by pixel basis.

Appellants' claim 1 requires, rather than the two separate fast scan filters shown in Figure 2, "a single second dimension filter" for receiving the output signals from the first dimension filters and means for controlling the "non-predetermined selection" of the first dimension filter and the set of filter coefficients to be used as inputs to the single second dimension filter. An embodiment of the invention is shown in appellants' Figure 3, which includes a multiplexer for selecting the output of the appropriate slow scan (first dimension) filter as input to the single fast scan (second dimension) filter, with multiplexing of two fast scan filter coefficients, for proper matching of the first and second dimension filters.

Thompson discloses, in "Prior Art" Figure 1, one of several filters -- a plurality of "M" -- which is comprised of coefficients in memory 11 that operate on data in memory 13 through multiplier/accumulator 15. The output is to register 17. See Thompson, column 2, lines 14-63. For advantages such as reduction in circuitry (see id. at column 4, line 64 through column 5, line 8), Thompson teaches using "one of M" multiplexor 32 for directing output of each of filters 1 through M to appropriate output registers 1 (34) to M (36).

We find the teachings of Thompson to be representative of the well-known advantages and tradeoffs with respect to the use of multiplexers in digital processing. We further find that the artisan would have been motivated to replace the redundant circuitry as shown in appellants' prior art Figure 2 for the purpose of decreasing hardware requirements, with full awareness of the tradeoffs associated with reduction in speed of processing. The examiner, on page 6 of the Answer, explains how the artisan would have found the particular refinements of the independent claims to be rendered obvious by the knowledge of the prior art.

Appellants' arguments on pages 22 through 24 of the Brief, concerning Thompson's lack of disclosing a "real-time" filter system, are not well taken. The arguments fail to take into account the admitted prior art as represented by instant Figure 2. As admitted at the bottom of page 23 of the Brief, prior art Figure 2 is directed to a parallel channel, "real-time" filter system. Thompson teaches that in his invention speed of processing is a concern, and indeed is improved over the prior art. See, for example, column 1, lines 28 through 32, wherein prior art software implementations were considered to lack speed and efficiency. Appellants' characterization of Thompson as disclosing a "sequential" filter is of little import. Instant prior art Figure 2 also discloses filters which are effectively "sequential," since the outputs of filter 1 and filter 2 are selected one at a time by means of multiplexer 72. Appellants' invention, as shown in instant Figure 3, is in a similar sense "sequential," as the ultimate output is selected from one filter and then another. Moreover,

appellants' claim 1 requires only three filters: two first dimension filters and a single second dimension filter. Any delays in processing of the "real-time" data in the suggested system appear to be de minimis, upon consideration of the broad scope of the claim.

Appellants' arguments regarding Thompson's lack of "non-predetermined selection of a first dimension filter" (Brief, pages 22-23) fail to show nonobviousness of the claimed subject matter. Appellants do not explain what magic is thought to reside in the language; based on appellants' commentary it appears that "non-predetermined" was added to the claims solely because Thompson uses the word "predetermined." In any event, the examiner makes clear on page 17 of the Answer that it is appellants' prior art Figure 2, not Thompson, that is relied upon as demonstrating "non-predetermined selection."

For answer to appellants' arguments in support of dependent claims 2 and 10, appearing on page 25 of the Brief, we refer to the reasoning of the examiner as set forth on page 18 of the Answer. Appellants' arguments in defense of claim 2 consist of listing the deficiencies of each piece of evidence in turn, which is not properly responsive to the rejection based on the combination of the two. Nonobviousness cannot be established by attacking prior art evidence individually where the rejection is based upon the combined teachings of the prior art. See In re Merck & Co., 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986)(citing In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)("Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.")). The

arguments in support of claim 10 also attack the APA and Thompson individually, and otherwise rely on the characterization of Thompson's disclosure as a "sequential" filter system. We have determined previously, as set forth supra, that the argument is unavailing.

Appellants' position in support of dependent claim 31 appears on page 26 of the Brief. We do not deem the examiner's statements on pages 18 and 19 of the Answer as sufficient to show obviousness of the subject matter of dependent claim 31. However, Thomson provides evidence that the artisan would have considered as obvious the claimed subject matter including the further steps of storing digital signals in a one-dimensional array and retrieving "one or more" of the signals stored in the array for use as input to the first stage of the filters. (The signals shown in appellants' prior art Figure 2 are from an "external source.") Thompson shows in Figure 2, and describes at column 2, line 64 through column 3, line 66, a one-dimensional array of data (28), and retrieving one member of the array at a time for input to the associated digital filter. New data values may be written into array 28 at the end of the present filtering for use in a next sequence of filtering. Thus the artisan would have recognized the advantages in temporary storage of the input signals in a one-dimensional array, for the ordered progression necessary in a digital filtering operation.

The examiner adds Kobayashi to the combination of the APA and Thompson in the rejection of claims 33 and 34. (See Answer, pages 9-10.) Appellants' argument in regard

to the claims, other than relying on the arguments presented for the independent claims ("claims 1 and 30"), is that "Kobayashi...does not appear to teach or even suggest that a first dimension filter may be selected as the input for a second dimension filter based upon the class of image represented by the digital signals...." (Brief, pages 26-27.) However, as the statement of rejection is set out in the Answer, and as the examiner further explains on pages 19 and 20 of the Answer, Kobayashi has not been relied upon for all the teachings that it is alleged to lack. As such, appellants have not shown that the combined teachings would not have suggested the subject matter as a whole of claims 33 and 34.

We note that appellants submit arguments with respect to claim 24 in the Reply Brief. The arguments are untimely, since they are not in response to any new points of argument in the Answer. (The Final Rejection (page 5) incorporated by reference the rejection set forth in Paper No. 18, in which claim 24 was rejected on pages 5 and 6 using the same language repeated on pages 7 and 8 of the Answer.) See 37 CFR § 1.192(a) ("Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown."). Moreover, it is of no moment that the examiner has not shown the allegedly lacking teachings in the reference. As set forth in the paragraph bridging pages 7 and 8 of the Answer, it is appellants' prior art Figure 2 which supplies the teachings for the "means...for reading the stored output signals from the selected context buffer," and the combined teachings of the prior art which suggest the "means for selecting."

Appeal No. 1998-0220
Application No. 08/297,437

Since appellants have not shown either of the section 103 rejections to be in error, we sustain the rejection of claims 1, 2, 8-11, 17, 18, 24, 30, and 31 under 35 U.S.C. § 103 as being unpatentable over the APA and Thompson, and the rejection of claims 33 and 34 under 35 U.S.C. § 103 as being unpatentable over the APA, Thompson, and Kobayashi.

CONCLUSION

The rejection of claims 1, 2, 8-11, 17, 18, 24, 30, 31, 33, and 34 is affirmed.

Appeal No. 1998-0220
Application No. 08/297,437

No time period for taking any subsequent action in connection with this appeal may
be extended under 37 CFR § 1.136(a).

AFFIRMED

JERRY SMITH)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
MICHAEL R. FLEMING)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
HOWARD B. BLANKENSHIP)	
Administrative Patent Judge)	

Appeal No. 1998-0220
Application No. 08/297,437

RONALD ZIBELLI
XEROX CORPORATION
XEROX SQUARE 020
ROCHESTER , NY 14644